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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of: Frattini, *et al.* Confirmation No.: 4759  
Serial No.: 10/014,619 Art Unit: 3663  
Filed: December 10, 2001 Examiner: Palabrica, Ricardo J.  
For: *Apparatus and Method for Ultrasonically Cleaning Irradiated Nuclear Fuel Assemblies* Attorney Docket No: 060825-0306-US

**PRE-APPEAL BRIEF REQUEST FOR REVIEW**

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Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Sir:

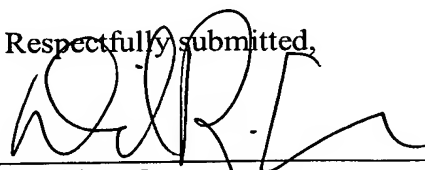
Applicants request review of the final rejection in the above-identified application. No amendments are being filed with this request. This request is being filed with a Notice of Appeal. The review is requested for the reasons stated on the following pages. The undersigned is the attorney of record.

This request is being filed by Express Mail within the three month period for response to the final Office Action mailed on October 28, 2005. Accordingly, Applicants believe that no fee is due with this submission. However, if it is determined that a fee is due, please charge the required fee to Morgan, Lewis & Bockius LLP Deposit Account No. 50-0310. A copy of this sheet is enclosed for this purpose.

Respectfully submitted,

Date: January 30, 2006

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## **Background**

The final Office Action for the above-identified application rejected all of the pending claims. Applicants believe there is clear error in each of the rejections and request this review, noting that Applicants are not raising every appealable issue.

## **The 35 U.S.C. § 112 Rejections**

Independent claims 21, 31, 34, and 37 recite the dimensions of certain elements of the claimed apparatus for cleaning a nuclear fuel assembly by reference to the fuel assembly to be cleaned and the spacing of its fuel rods. A claim element may be defined in terms of the environment in which it will be used, and § 112 does not require a recitation of all possible dimensions to satisfy its definiteness requirement. The rejection of these claims under § 112, which is based on the mere existence of different fuel assemblies, should be withdrawn.

Independent claims 21 and 37 each recite, in part:

... [a] housing having an opening at a first end configured to receive an irradiated nuclear fuel assembly ... , wherein *said housing has a length at least as long as the irradiated nuclear fuel assembly*; ... (emphasis added).

Independent claims 31 and 37 each recite, in part:

... [a] housing ... configured to receive an irradiated nuclear fuel assembly comprising a plurality of fuel rods and a spacing between each of said fuel rods ... ; and  
a plurality of ultrasonic transducers ... having *a node structure that is an approximate multiple of said spacing between each of said fuel rods* (emphasis added).

And, independent claim 34 recites in part:

... an elongated housing configured to receive *an irradiated nuclear fuel assembly having at least four sides*; [and]  
a plurality of ultrasonic transducers ... such that at least *a first one of said ultrasonic transducers is adjacent to a first one of said four sides of said irradiate nuclear fuel assembly* ... (emphasis added).

Claims 21, 31, and 37 are rejected based on the mere existence of different types of fuel assemblies with different lengths and different fuel rod spacings (Office Action mailed 5/9/05, section 3). Claim 34 is rejected on the basis that not all fuel assemblies have “sides” (*Id.*). In other words, each of these claims has been rejected because a certain element has been recited in terms of, or relative to, the fuel assembly to be cleaned (*i.e.*, the workpiece or environment in which the claimed apparatus for cleaning a fuel assembly will be used).

Applicants discussed the relevant case law in their Response dated 9/23/05. The Federal Circuit in *Moore U.S.A., Inc. v. Standard Register Company*, 299 F.3d 1091, 1111 (Fed. Cir. 2000), held, in the context of analyzing an indefiniteness rejection of the term “distance sufficient”, that “there is nothing wrong with defining the dimensions of a device in

terms of the environment in which it is to be used". The Federal Circuit in *Orthokinetics, Inc. v. Safety Travel Chairs, Inc.*, 806 F.2d 1565, 1575-76 (Fed. Cir. 1986) held that claims to a travel chair were intended to cover the use of the invention with various types of automobiles and that the phrase "so dimensioned as to be insertable through the space between the doorframe of an automobile and one of the seats thereof" is "as accurate as the subject matter permits, automobiles being of various sizes. As long as those of ordinary skill in the art realized that the dimensions could be easily obtained, § 112, 2d ¶ requires nothing more. The patent law does not require that all possible lengths corresponding to the spaces in hundreds of different automobiles be listed in the patent, let alone that they be listed in the claims." The Examiner rejected this case law based on the argument that the claim language in those cases was part of an "intended or desired use clause" and that the claim language in the present application is part of a positively recited element (*i.e.*, part of the irradiated nuclear fuel assembly) (Final Office Action mailed 10/28/05, section 2).

First, nothing in the cited cases requires that such claim language be in an "intended or desired use clause". (Applicants note, however, that the Examiner has stated that the claim language regarding the node structure and fuel rod spacing in claims 31 and 37 *is* a statement of intended or desired use" (Final Office Action mailed 10/28/05, section 5, referring to section 3).) Second, the Examiner's contention that the irradiated nuclear fuel assembly is a positively recited element is incorrect. The fuel assembly is a workpiece and is not recited as a positive element, which is why it appears indirectly in a phrase of the claim body describing the positively recited housing that is configured to receive an irradiated nuclear fuel assembly. The Examiner even points out that the fuel assembly is part of an intended or desired use clause in the preamble of the claim (Office Action mailed 5/9/05, section 3) but argues that such is contradictory with the body of the claim. To the contrary, the preamble makes clear that the fuel assembly is not an element of the claim but is simply part of the environment in which the claimed apparatus will be used.

The fuel assembly is analogous to the automobile, and the fuel rod spacing is analogous to the space between the doorframe of an automobile and one of the seats thereof discussed in *Orthokinetics*. There the applicant was not required to define the dimensions of hundreds of cars. Here too, Applicants should not have to define each and every fuel assembly, its length, or fuel rod spacing, particularly because one of skill in the art can easily understand and ascertain these dimensions.

Similarly, the housing in claim 34 is recited as being configured to receive "a nuclear fuel assembly having at least four sides" (emphasis added). One of skill in the art would

clearly understand this language and the recitation that a transducer is adjacent to one of these sides. The Examiner's argument that such language is indefinite because some fuel assemblies do not have "sides" ignores the claim language specifying that the housing is configured to receive a fuel assembly that *has* at least four sides.

The claim language at issue describes certain claim elements in the context of their environment. There is no requirement that such claim language appear in an "intended or desired use clause". One of skill in the art would easily understand and ascertain the dimensions to which the claim language in claims 21, 31, 34, and 37 refers. Nothing more is required under § 112, and Applicants request an opinion that these rejections should be withdrawn.

### **The 35 U.S.C. § 102(b) Rejections**

Independent claims 21, 31, and 37 recite transducers that each produce omnidirectional energy waves, and claims 31 and 37 further recite a node structure that is an approximate multiple of the spacing between the fuel rods of the fuel assembly. A rejection under § 102(b) requires that each and every element of the claim be taught by a single reference. The reference relied upon to reject these claims, EP 0418722 A1 ("Fiorenzo"), fails to teach transducers that produce omnidirectional energy waves or the claimed node structure, and the § 102 rejection as to these claims should be withdrawn.

Fiorenzo teaches a tank within a tank, wherein transducers are attached to the outside wall of the outer tank and ultrasonic energy is conveyed in one direction: through the outer tank, into the liquid between the tanks, through the inner tank, and ultimately to a wash solution inside the inner tank (see Response filed 9/23/05, pages 9-10). Fiorenzo does not describe the transducers as producing omnidirectional energy waves. Fiorenzo states "An assembly of ultrasound emitting piezoelectric transducers . . . being of such specification and number as to maintain in the inner tank 5A a homogeneous power density of 25 Watt per liter (W/l)." (Fiorenzo at col. 2, ll. 40-45.) Fiorenzo is not describing the type of energy provided specifically by a transducer. Rather, Fiorenzo is simply stating that the transducers need to collectively produce a given power density in the wash solution, which would naturally be described on a per volume basis.

To supply the missing teaching of transducers that produce omnidirectional energy waves, the Examiner combines a statement from a Declaration previously submitted in this application that stated:

Omnidirectional transducers are typically described in terms of power per unit volume (e.g., W/l or W/gal) in the intended cleaning bath geometry, because the surface energy varies so significantly over the surface of the transducer.

(Declaration of David Gross filed 1/19/05, paragraph 11d). While this statement indicates that omnidirectional transducers are *typically* described in terms of power per unit volume, it does not state that simply because a power density is described on a per volume basis that every transducer that contributes to such power density is omnidirectional. To conclude as much mis-construes this statement. Also, if Fiorenzo did teach omnidirectional transducers, the Examiner would not need to combine Fiorenzo with the Gross Declaration.

Moreover, based on the process described in Fiorenzo and the context in which the transducers are being used, Fiorenzo actually teaches planar transducers (see Response filed 9/23/05, pages 9-10 providing various reasons for this conclusion). Notably, because the transducers are located on the outer wall of the outer tank, it is imperative to direct the energy from the transducers toward the center of the inner tank. This is accomplished using planar transducers, which produce a unidirectional energy wave. One of skill in the art would not use omnidirectional transducers in the process of Fiorenzo since the energy waves would emanate in all directions, including away from the wall of the outer tank and the intended target.

The Examiner dismissed this and other arguments on the basis that Applicants' claims were apparatus claims and not process claims (Final Office Action mailed 10/28/05, section 3). This misses the point, which is to illustrate that the process of Fiorenzo calls for planar transducers and cannot be construed as teaching omnidirectional transducers. Further, the Examiner's statement that Fiorenzo does not *exclude* any particular type of transducer (Final Office Action mailed 10/28/05, section 4) cannot be used to conclude that Fiorenzo does teach omnidirectional transducers and actually further evidences the lack of such teaching.

Fiorenzo also fails to teach or suggest the claimed node structure as recited in claims 31 and 37, because Fiorenzo is directed to heat exchangers tubes (Fiorenzo, col. 2, lines 3-8) and does not discuss using a node structure based upon the spacing of *fuel rods* in a nuclear fuel assembly. The Examiner dismissed this lack of teaching on the basis that the recited node structure is a statement of intended use because the node structure is recited relative to the fuel rod spacing of the fuel assembly (Final Office Action mailed 10/28/05, section 5, referring to section 3). Clearly, the node structure of the energy waves produced by the recited transducers is a limitation of the transducers themselves that must be taken into account.

Fiorenzo fails to teach transducers that produce omnidirectional energy waves or the recited node structure. A Declaration cannot be mis-construed to supply this missing teaching nor can the recited node structure be ignored. Fiorenzo fails as an anticipatory reference, and Applicants request an opinion concluding that these rejections should be withdrawn.

**The 35 U.S.C. § 103(a) Rejections**

Independent claim 34 recites transducers positioned on a housing and that there is at least one transducer adjacent to each of the four sides of a fuel assembly to be cleaned. A rejection under § 103(a) requires that the references teach or suggest each and every limitation of the claim. Because the combination of Fiorenzo and U.S. Patent No. 4,320,528 (“Scharton”) fail to teach a transducer adjacent to the side of the fuel assembly, the § 103(a) rejection as to this claim should be withdrawn.

As noted above, Fiorenzo teaches a tank within a tank with transducers positioned on the outside wall of the outer tank to clean radioactive equipment inside the inner tank (Fiorenzo, col. 1, lines 1-6). Scharton teaches that *special* transducers can be placed on the inside or outside of the shell of a heat exchanger (Scharton, col. 5, lines 19-23). The Examiner contends that it would be obvious in light of Scharton to move the transducers of Fiorenzo from the outside wall of the outer tank to the inside wall of the inner tank (Office Action mailed 5/9/05, section 6).

Applicants argued that applying the teaching of Scharton to Fiorenzo would result in the placement of the transducers on the inside wall of the outer tank, not on the inside wall of the inner tank and not adjacent to the equipment being cleaned (Response filed 9/23/05, pages 12-13). The teaching of Scharton, particularly with reference to the fact that “special” transducers are required, does not provide motivation to move the transducers in Fiorenzo from the dry outside wall of the outer tank to a submerged radioactive location on the inside wall of the inner tank. Further, Scharton is directed to cleaning scale and oxides from heat exchangers (Scharton, Abstract) and not to cleaning radioactive material, which also eliminates the motivation to combine these references. Accordingly, one of skill would not have an expectation of success in making the suggested modification to Fiorenzo.

Neither Fiorenzo nor Scharton teach or suggest every element of independent claim 34, such as the recited location of the transducers. In addition, one of skill in the art would not be motivated to combine these references or have an expectation of success in their combination. Therefore, Applicants request an opinion concluding that this rejection should be withdrawn.